REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application. Claims 1-30 are pending in this application.

Objections to Claims

Claim 28 was objected to under 37 CFR 1.75(c) as being of improper dependent form for not differing substantially from claim 27. Claim 28 has been amended to change its dependency to base claim 8 and its language to accord with antecedent terms of claim 8, thereby removing the objection. The amendment of claim 28 does not narrow its scope.

Rejection of the Claims

Rejections under 35 USC § 102(a)

The Patent Office rejected claims 1-6, and 23 under USC § 102(a) as being anticipated by an article reference of Kim et al., entitled "A Thin Shell Volume for Modeling Human Hair," IEEE, May 2000, pages 104-111 (hereinafter "the Kim reference" or just "Kim"). Applicant respectfully traverses Kim as a prior art reference, and respectfully disagrees with the Office's characterization of Kim, but Applicant nonetheless amends claim 1 to more particularly point out and distinctly claim Applicant's subject matter. The claim amendment does not narrow the scope of claim 1 but merely states an inherent feature of the claim, clarifying the

claimed subject matter without prejudice.   Applicant respectfully submits that claim 1 as amended is not anticipated by the Kim reference.

Claim 1

<u>The Kim reference does not expressly or inherently describe each element of claim 1.</u>

In the MPEP § 2131, anticipation under 35 U.S.C. § 102 requires that:

> "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Applicant's claim 1 as amended defines a method of:

generating a mesh grid representation of uncovered surfaces of an object, the mesh grid including at least one grid element;
simulating hair by associating at least one seed with each grid element; and
generating the hair *in real time*, wherein at least one hair extends from each seed, at least a portion of the hair extending beyond a plurality of boundaries of the grid element. (Emphasis added.)

Applicant's subject matter generates the hair in real time. (The feature of *real time* hair or surface detail simulation is supported variously throughout Applicant's specification, for example, at page 5, line 6; page 6, lines 4-6; page 10, line 19; page 11, lines 2 and 15; page 18, line 2; page 24, lines 16 and 20; page

25, lines and 12; the abstract at page 33, line 5; and in the parent provisional application entitled, "Real-Time Hair.")

The Kim reference presents a simulation of long human hair that takes into account hair-to-hair interactions, for purposes of displaying the appearance of combed hair. Page 109, lines 29-38 of section 6, "Implementation and Results" of the Kim reference states that:

> "Our implementation runs on an SGI Onyx R10000 (only a single CPU and graphics pipe is utilized). It takes about 20-30 seconds to comb and generate the model shown in Plate 2 (4000 hairs). Rendering is fast (1-2 seconds per frame). All the images shown are rendered at 512 x 512 pixel resolution. ... A large fraction of the computing time is consumed in the reconstruction of the hair strand from the TSV [thin shell volume] particles due to the numerous evaluations of the Coons Patch."

Hence, the Kim reference does not disclose real time simulation. A rendering rate of 1-2 seconds per frame is not real time.

Since Kim reference does not disclose one or more elements of claim 1, Applicant respectfully submits that the Kim reference does not anticipate Applicant's claim 1 under 35 USC § 102(a). Applicant therefore submits that claim 1 is patentable over Kim and earnestly seeks the allowance of claim 1.

Claims 2-6, and 23

For at least the reasons set forth above with respect to claim 1, Applicant submits that claims 2-6, and 23 are patentable over the Kim reference. Dependent claims contain the language of the claims from which they depend. Claims 2-6,

and 23 depend directly or indirectly from claim 1. Therefore, claims 2-6, and 23 are also allowable.

Rejection Under 35 U.S.C. § 103(a)

Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Kim in view of an article by Meyer et al., entitled "Interactive Volumetric Textures," iMAGIS laboratorie GRAVIR/IMAG-INRIA, France, 1998 (hereinafter "the Meyer reference," or "Meyer"). Claims 8-13, 15-20, and 24-30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kim in view of U.S. Patent No. 5,758,046 to Rouet (the "Rouet reference, or "Rouet"). Claims 14, 21, and 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kim in view of Rouet and further in view of Meyer.

The Patent Office Has Not Established A Prima Facie Case Of Obviousness Under 35 U.S.C. § 103(a)

To establish a prima facie case of obviousness, the prior art references, when combined, must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Claim 7

Claim 7 depends from claims 6, 5, and base claim 1. The features of claim 7, including the features of claims 6, 5, and base claim 1 are not taught or suggested by a combination of Kim and Meyer.

The Kim reference does not teach or suggest one or more of claim 7's elements, such as generating simulated hair in real time. Due to its objective of modeling hair-to-hair interactions of combed human hair even at the expense of speed, no teaching or suggestion that the Kim simulation is capable of real time execution is found in the Kim reference, rather the asserted maximum speed is one frame per second.

The Meyer reference is directed to "Interactive Volumetric Textures." Meyer teaches a ray-tracing method, that consists in slicing 3-D geometry into thin layers. The Meyer reference does not teach or suggest claim 1's element of real time simulation, and when combined with the Kim reference does not cure the missing teaching in the Kim reference to produce Applicant's feature of real time simulation. Hence, the combination of Kim and Meyer fails to produce an obviousness rejection.

Applicant respectfully requests that the obviousness rejection be removed from claim 7 and earnestly seeks its allowance.

Claims 8-13, 15-20, and 24-30

Claims 8-13, 15-20, and 24-30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kim in view of Rouet.

Claims 8, 15, and 26

Claims 8, 15, and 26 are independent base claims. Claim 8 defines a storage medium that includes executable instructions capable of implementing real time simulation of surface detail. Claim 15 defines an apparatus capable of real time simulation of surface detail. Claim 26 defines a method capable of real time simulation of surface detail.

Each of independent claims 8, 15, and 26 include a feature of real time capability. As already discussed above, the Kim reference does not teach or suggest generating simulated hair or other surface detail in real time.

The Rouet reference does not teach or suggest the real time generation of simulated surface detail of Applicant's claims 8, 15, and 26. When combined with the Kim reference, the Rouet reference does not cure the deficient teaching in the Kim reference to produce Applicant's feature of real time surface detail simulation in claims 8, 15, and 26. Hence, the combination of Kim in view of Rouet fails to produce an obviousness rejection.

Applicant respectfully requests that the obviousness rejection be removed from claims 8, 15, and 26 and earnestly seeks their allowance.

Claims 9-13, 24, and 28

Claims 9-13 and 24 depend directly or indirectly from claim 8. Claim 28 as amended also depends from claim 8. For at least the reasons set forth above with respect to claim 8, Applicant submits that claims 9-13, 24, and 28 are patentable over the combination of Kim in view of Rouet. Dependent claims contain the language of the claims from which they depend. Claims 9-13, 24, and 28 depend from claim 8. Therefore, claims 9-13, 24, and 28 are also allowable.

Claims 16-20 and 25

Claims 16-20 and 25 depend directly or indirectly from claim 15. For at least the reasons set forth above with respect to claim 15, Applicant submits that claims 16-20 and 25 are patentable over the combination of Kim in view of Rouet. Dependent claims contain the language of the claims from which they depend. Claims 16-20 and 25 depend from claim 15. Therefore, claims 16-20 and 25 are also allowable.

Claims 27 and 29-30

Claims 27 and 29-30 depend directly or indirectly from claim 26. For at least the reasons set forth above with respect to claim 26, Applicant submits that claims 27 and 29-30 are patentable over the combination of Kim in view of Rouet. Dependent claims contain the language of the claims from which they depend. Claims 27 and 29-30 depend from claim 26. Therefore, claims 27 and 29-30 are also allowable.

Claims 14, 21, 22

Claims 14, 21, and 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kim in view of Rouet and further in view of Meyer.

Claims 14

Claim 14 depends indirectly from claim 8. As shown above, claim 8 includes a feature of *real time* generation of simulated surface detail. As laid out in the above discussions of the Kim-Meyer combination and the Kim-Rouet combination, the Kim, Rouet, and Meyer references, singly or in combination, do not teach or suggest *real time* surface detail simulation. Specifically, Meyer adds nothing to the combination of Kim in view of Rouet to cure the missing teaching or suggestion (of claim 8's *real time* feature) in the combination of Kim in view of Rouet.

For at least this reason, Applicant submits that claim 14 is patentable over the combination of Kim in view of Rouet further in view of Meyer.

Claims 21, 22

Claims 21, 22 depend indirectly from claim 15. As shown above, claim 15 includes a feature of *real time* generation of simulated surface detail. As laid out in the above discussions of the Kim-Meyer combination and the Kim-Rouet combination, the Kim, Rouet, and Meyer references, singly or in combination, do not teach or suggest *real time* surface detail simulation. Specifically, Meyer adds nothing to the combination of Kim in view of Rouet to cure the missing teaching

or suggestion (of claim 15's *real time* feature) in the combination of Kim in view of Rouet.

For at least this reason, Applicant submits that claims 21, 22 are patentable over the combination of Kim in view of Rouet further in view of Meyer.

CONCLUSION

Applicants respectfully suggest that claims 1-30 are in condition for allowance. Applicants respectfully request reconsideration and issuance of the subject application. Should any matter in this case remain unresolved, the undersigned attorney respectfully requests a telephone conference with the Examiner to resolve any such outstanding matter.

Respectfully Submitted,

Date: 9-22-04   By: _____
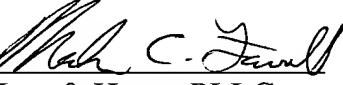
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